

***Pseudoblothrus infernus* sp. n. (Pseudoscorpiones, Syarinidae) from the Hölloch cave (Schwyz, Switzerland), with new records of *Pseudoblothrus strinatii* Vachon from Switzerland and France**

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***Pseudoblothrus infernus* sp. n. (Pseudoscorpiones, Syarinidae) from the Hölloch cave (Schwyz, Switzerland), with new records of *Pseudoblothrus strinatii* Vachon from Switzerland and France.** - The new species *Pseudoblothrus infernus* n. sp. is described from the Hölloch cave in the canton of Schwyz, Switzerland. It is the third species of this genus recorded from this country. New records are given for *Pseudoblothrus strinatii* Vachon, found in caves of the Jura Mountains of Switzerland (canton of Neuchâtel) and in France (Doubs department).

Keywords: Biospeleology - taxonomy.

INTRODUCTION

The Pseudoscorpion family Syarinidae is represented in Europe by four genera, two of which (*Pseudoblothrus* Beier and *Hadoblothrus* Beier) are strictly troglobiont and considered to be thermophilous relict forms of the Tertiary (Beier, 1970; Strinati, 1966). Nine *Pseudoblothrus* species have been described from caves in Italy, Portugal (Azores Archipelago), Switzerland and Ukraine. In Switzerland, *Pseudoblothrus strinatii* Vachon has been recorded from four caves of the Jura Mountains (cantons of Neuchâtel and Jura), and a second species, *Pseudoblothrus thiebaudi* Vachon, from two caves in the Alps (cantons of Bern and Vaud).

Dr Ulrich Jörin (Zurich) first sent me a photograph of a pseudoscorpion collected in the Hölloch cave ("Hell's Hole"; canton of Schwyz) representing almost certainly a *Pseudoblothrus* species. The study of the specimen confirmed the generic position and revealed a new species described below. The Hölloch is one of the most frequently visited caves in Switzerland, one of the biggest caves in the world, with about 200 km of galleries and corridors, extending to a depth of more than 900 m. Despite intensive speleological exploration, knowledge of its fauna is fragmentary and no true troglobiont arachnid species has yet been recorded. The occurrence of this pseudoscorpion species is therefore surprising, since it seems to be more related to *P. strinatii* from caves in the Jura Mts than to *P. thiebaudi* from two geographically closer caves in the Alps (Vachon, 1969). Its close relationship with *P. strinatii* can be compared with the geographical distribution of two troglobiontic insect species (*Litocampa* (= *Plusiocampa*) *sollaudi* (Denis), Diplura, Campodeidae, and *Pseudosinella vandeli relicta* Gisin, Collembola, Entomobryidae) which are considered by Strinati

(1966) and Stomp (1977) as thermophilous relicts whose ancestors invaded subterranean habitats during the great glaciations.

MATERIAL AND METHODS

The specimen was mounted on a temporary slide, in glycerine, and studied under a Nikon Optiphot compound microscope, drawings were done with a Nikon drawing tube. The specimen and dissected parts (legs I and IV, pedipalp, chelicera) are conserved together in alcohol. Trichobothrial nomenclature follows Chamberlin (1931).

All studied specimens are deposited in the collections of the Muséum d'histoire naturelle, Geneva, Switzerland (MHNG, without registration number).

DESCRIPTIONS

Pseudoblothrus strinatii Vachon

NEW RECORDS: MHNG, Switzerland, Jura Mountains, Boudry (canton of Neuchâtel), source de Combe-Garot, gorges de l'Areuse, 533 m a.s.l., found in a water filtering net; 8.IX.1985, leg. P. Moeschler: 1 protonymph. – MHNG, France, Département Doubs, Chenecey-Buillon, gouffre des Granges-Mathieu, piège; 18.VIII.1968, leg. H. Colin: 1 tritonymph.

REMARKS: The "source de Combe-Garot" is also where the harpactoid *Gelyella monardi* Moeschler & Rouch, 1988 (Crustacea) was collected, again by water filtration. Since the protonymph of *P. strinatii* is undescribed, specific identification is based on geographical considerations.

Three males from the cave "Grand creux de Montfaucon (cave BE 37 in Strinati, 1966) show the following proportions of pedipalpal patella and chela (with pedicel): patella 4.2-4.7 times longer than broad (0.89-1.00 mm/0.21 mm), chela with pedicel 5.6-5.9 times longer than broad (1.65-1.86 mm/0.29-0.31 mm), finger 1.4-1.5 times longer than hand with pedicel. These proportions are more slender than those indicated for the holotype from the Grotte de Pertuis (Strinati, 1966: cave NE 26 by Vachon, 1957). All three males possess three patches of glandular setae in their ventral gland.

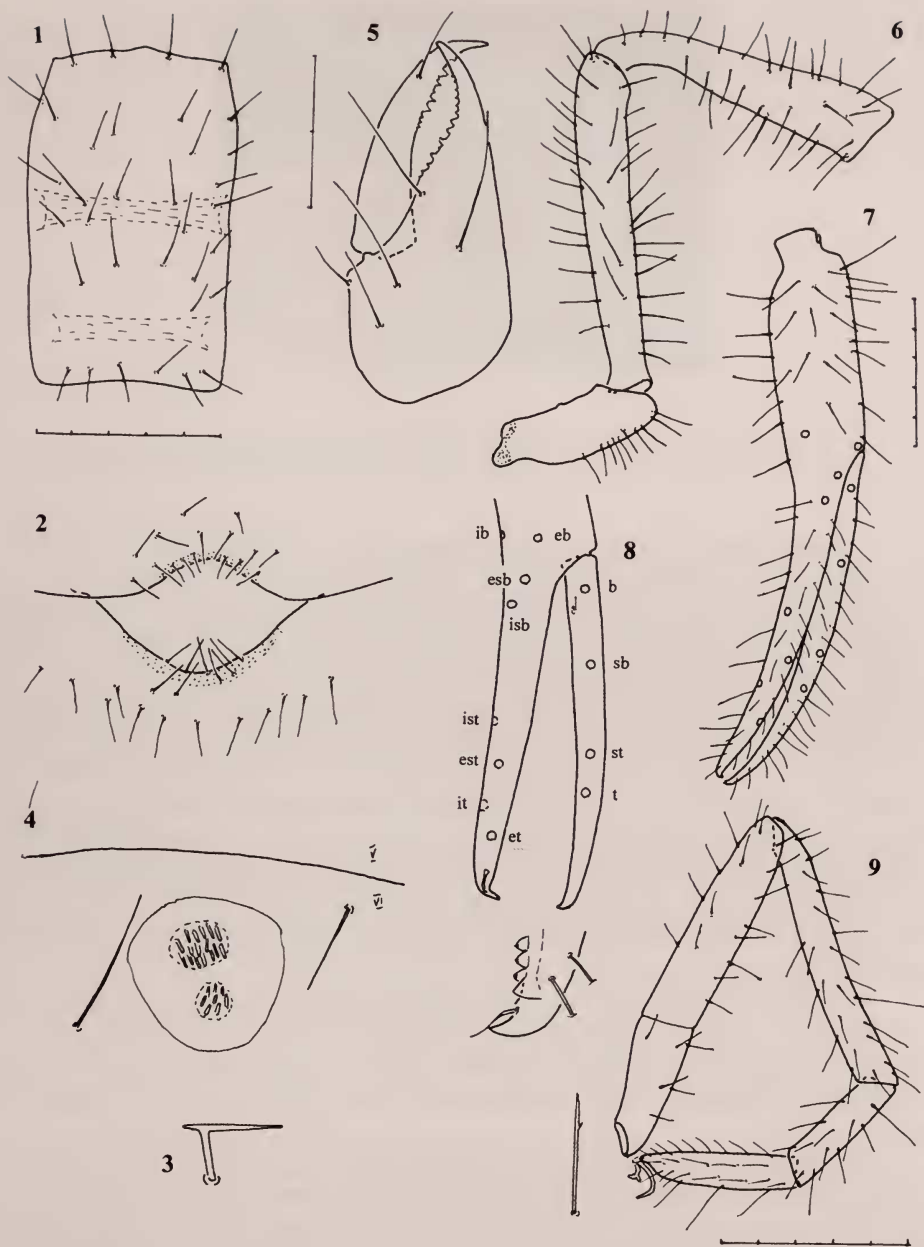
Pseudoblothrus infernus sp. n.

Figs 1-9

SPECIMEN EXAMINED: MHNG; holotype 1 ♂; Switzerland, canton of Schwyz, Muotathal, Hölloch (Strinati, 1966: SZ 1), carstic corridor named "Konsummeile", ("substrats de sable et limon, mouillé"), near waste of old bivouac ("près d'un dépôt de déchets (20 m) d'un bivouac": U. Jörin, in litt.), 1500 m from entrance, 200 m depth; 27.12.2009, leg. U. Jörin & M. Pulfer.

DIAGNOSIS: The presence, in the male, of ventral glands on sternite VI and the smooth pedipalpal femur and hand places *P. infernus* sp. n. close to *P. strinatii*. The new species differs by the morphology of the ventral glands (only two patches of glandular setae vs three in *strinatii*), the number of setae on anterior margin of cephalothorax (4 vs 6 in *strinatii*) and by the more slender pedipalpal chela (6.4 times longer than broad vs 5.5-5.9 times in *strinatii*). Ventral glands are absent in *P. thiebaudi* Vachon.

DESCRIPTION: Cephalothorax and pedipalps reddish brown, tergites I and II large, brown, the following narrower, yellowish.



FIGS 1-9

Pseudoblothrus infernus sp. n., ♂ holotype. (1) Cephalothorax. (2) Sternites II (anterior genital operculum) and III. (3) Teratological lateral seta of sternite V. (4) Ventral gland on sternite VI. (5) Left chelicera. (6-7) Left pedipalp. (8) Trichobothrial pattern, with details of tip of movable finger (higher magnification). (9) Left leg IV, with subterminal seta (higher magnification). Scale units 0.1 mm.



FIG. 10

Pseudoblothrus infernus sp. n., holotype, alive; copyright Dr Ulrich Jörin, Zurich.

Cephalothorax (Fig. 1) 1.6 times longer than broad, without eyes or eyespots, with two distinct transverse furrows, the subbasal one narrower; middle of anterior margin broadly rounded: 33 setae (4 at anterior, 6 at posterior margin). Chaetotaxy of tergites I-XI: 5-9-10-10-13-12-13-13-8(2 lateral, 2 sublateral tactile setae)-7(4 tactile setae); manducatory lobe with 1(right) or 2(left) setae, pedipalpal coxa smooth, 7-8 setae, coxa I 5, II 7-8, III 2-3, IV 7-8; anterior genital operculum with 16 setae (6 median marginal setae) (Fig. 2), genital chamber with 2 unmodified setae, sternite III: 12 + 6 median discal setae + 4 suprastigmal setae, IV 12 + 7 median discal setae + 4 suprastigmal setae, V 15 + 6 median discal setae (one lateral seta abnormal, T-shaped: Fig. 3; a similar teratology was described for a sternophorid pseudoscorpion from Dominican amber: Judson, 1998), VI 16 + ventral gland + 2 median discal setae, VII 16, VIII 16, IX 14, X 14, XI 12 (4 tactile setae); anal cone 2+2 setae; ventral gland (Fig. 4) in a round central depression on sternite VI, with two patches of glandular tubules (17/8).

Chelicera (Fig. 5) with 5 long setae on hand, fixed finger with 13 pointed teeth, the distal ones smaller, movable finger with 10 pointed teeth of varying length, sub-galeal seta reaching tip of finger, spinneret absent, serrula exterior with 23, serrula interior with 16 lamellae, rallum composed of six setae, apparently only the distal one finely dentate.

Pedipalps (Figs 6-8) smooth, trochanter 3.0 times longer than broad, with a tiny button-like ventral tubercle, femur indistinctly club-shaped, 6.4 times, patella 4.5 times longer than broad, pedicel short, hand cylindrical, with pedicel 2.5 times longer than broad, chela with pedicel 6.4 times, without pedicel 6.1 times longer than broad; finger 1.6 times longer than hand with pedicel, fixed finger with 94 small pointed teeth, movable finger with about 88 small teeth, only the 15 distal ones pointed, distalmost tooth of row large and more lateral, venom duct in fixed finger very short. Trichobothrial pattern similar to that of *P. strinatii* and *P. thiebaudi*, *ib* slightly basal to *eb*, *esb* slightly nearer to *isb* than to *eb*, the four distal trichobothria equidistant from each other; a small sensillum distal of *b*.

Leg I: femur 5.6 times longer than deep and 1.8 times longer than patella, the latter 3.3 times longer than deep, tibia 6.4 times, basitarsus 4.1 times, telotarsus 6.0 times longer than deep and 1.3 times longer than basitarsus; leg IV (Fig. 9): femur+patella 6.0 times longer than deep, tibia 7.5 times, basitarsus 4.3 times, telotarsus 3.9 times longer than deep and 1.1 times longer than basitarsus; no distinct tactile setae present; subterminal seta finely dentate, arolia undivided and distinctly shorter than the thin and smooth claws.

Measurements (length/depth in mm): total length 2.4; cephalothorax 0.87/0.53; pedipalps: trochanter 0.55/0.18, femur 1.10/0.17, patella 0.98/0.22, pedicel 0.24, hand with pedicel 0.71/0.29, pedicel 0.07, finger length 1.15, chela length with pedicel 1.82; leg I: femur 0.58/0.10, patella 0.32/0.10, tibia 0.46/0.07, basitarsus 0.27/0.07, telotarsus 0.34/0.06; leg IV: femur+patella 0.92/0.15, tibia 0.74/0.10, basitarsus 0.36/0.08, telotarsus 0.41/0.10.

ETYMOLOGIE: The species epithet is a Latin adjective, meaning belonging to (or coming from) the underworld.

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